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20350 7590 04/01/2008

TOWNSEND AND TOWNSEND AND CREW, LLP
TWO EMBARCADERO CENTER
EIGHTH FLOOR
SAN FRANCISCO, CA 94111-3834

EXAMINER

SIDDIQI, MOHAMMAD A

ART UNIT

PAPER NUMBER

2154

DATE MAILED: 04/01/2008

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/684,221

10/02/2003

Kenji Yamagami

16869B-036610US

7117

TITLE OF INVENTION: REMOTE COPY WITH PATH SELECTION AND PRIORITIZATION

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	NO	\$1440	\$300	\$0	\$1740	07/01/2008

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED. THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.

THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED. SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE DOES NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW DUE.

HOW TO REPLY TO THIS NOTICE:

I. Review the SMALL ENTITY status shown above.

If the SMALL ENTITY is shown as YES, verify your current SMALL ENTITY status:

A. If the status is the same, pay the TOTAL FEE(S) DUE shown above.

B. If the status above is to be removed, check box 5b on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and twice the amount of the ISSUE FEE shown above, or

If the SMALL ENTITY is shown as NO:

A. Pay TOTAL FEE(S) DUE shown above, or

B. If applicant claimed SMALL ENTITY status before, or is now claiming SMALL ENTITY status, check box 5a on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and 1/2 the ISSUE FEE shown above.

II. PART B - FEE(S) TRANSMITTAL, or its equivalent, must be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed and an extra copy of the form should be submitted. If an equivalent of Part B is filed, a request to reapply a previously paid issue fee must be clearly made, and delays in processing may occur due to the difficulty in recognizing the paper as an equivalent of Part B.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

IMPORTANT REMINDER: Utility patents issuing on applications filed on or after Dec. 12, 1980 may require payment of maintenance fees. It is patentee's responsibility to ensure timely payment of maintenance fees when due.

PART B - FEE(S) TRANSMITTAL

**Complete and send this form, together with applicable fee(s), to: Mail Mail Stop ISSUE FEE
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INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

20350 7590 04/01/2008

**TOWNSEND AND TOWNSEND AND CREW, LLP
TWO EMBARCADERO CENTER
EIGHTH FLOOR
SAN FRANCISCO, CA 94111-3834**

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I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

(Depositor's name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/684,221 10/02/2003 Kenji Yamagami 16869B-036610US 7117

TITLE OF INVENTION: REMOTE COPY WITH PATH SELECTION AND PRIORITIZATION

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	NO	\$1440	\$300	\$0	\$1740	07/01/2008

EXAMINER	ART UNIT	CLASS-SUBCLASS
SIDDIQI, MOHAMMAD A	2154	709-217000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

- ☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.
- ☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list

- (1) the names of up to 3 registered patent attorneys or agents OR, alternatively, 1 _____
- (2) the name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed. 2 _____
- 3 _____

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE (B) RESIDENCE: (CITY and STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent) : ☐ Individual ☐ Corporation or other private group entity ☐ Government

4a. The following fee(s) are submitted:

- ☐ Issue Fee
- ☐ Publication Fee (No small entity discount permitted)
- ☐ Advance Order - # of Copies _____

4b. Payment of Fee(s); (Please first reapply any previously paid issue fee shown above)

- ☐ A check is enclosed.
- ☐ Payment by credit card. Form PTO-2038 is attached.
- ☐ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment, to Deposit Account Number _____ (enclose an extra copy of this form).

5. Change in Entity Status (from status indicated above)

- ☐ a. Applicant claims SMALL ENTITY status. See 37 CFR 1.27. ☐ b. Applicant is no longer claiming SMALL ENTITY status. See 37 CFR 1.27(g)(2).

NOTE: The Issue Fee and Publication Fee (if required) will not be accepted from anyone other than the applicant; a registered attorney or agent; or the assignee or other party in interest as shown by the records of the United States Patent and Trademark Office.

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Date _____

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This collection of information is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450.

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/684,221	10/02/2003	Kenji Yamagami	16869B-036610US	7117
20350	7590	04/01/2008	EXAMINER	
TOWNSEND AND TOWNSEND AND CREW, LLP TWO EMBARCADERO CENTER EIGHTH FLOOR SAN FRANCISCO, CA 94111-3834			SIDDIQI, MOHAMMAD A	
			ART UNIT	PAPER NUMBER
			2154	
DATE MAILED: 04/01/2008				

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b) (application filed on or after May 29, 2000)

The Patent Term Adjustment to date is 991 day(s). If the issue fee is paid on the date that is three months after the mailing date of this notice and the patent issues on the Tuesday before the date that is 28 weeks (six and a half months) after the mailing date of this notice, the Patent Term Adjustment will be 991 day(s).

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (<http://pair.uspto.gov>).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

Notice of Allowability

Application No.

10/684,221

Applicant(s)

YAMAGAMI ET AL.

Examiner

MOHAMMAD A. SIDDIQI

Art Unit

2154

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to 01/02/2008.
2. ☒ The allowed claim(s) is/are 1,4,7-12,14,15 and 17-20 (please rearrange claims 1-14).
3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some* c) ☐ None of the:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).
- * Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
- (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
- 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
- (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).**
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

- | | |
|--|--|
| 1. <input type="checkbox"/> Notice of References Cited (PTO-892) | 5. <input type="checkbox"/> Notice of Informal Patent Application |
| 2. <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 6. <input type="checkbox"/> Interview Summary (PTO-413),
Paper No./Mail Date _____. |
| 3. <input type="checkbox"/> Information Disclosure Statements (PTO/SB/08),
Paper No./Mail Date _____ | 7. <input checked="" type="checkbox"/> Examiner's Amendment/Comment |
| 4. <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit
of Biological Material | 8. <input type="checkbox"/> Examiner's Statement of Reasons for Allowance |
| | 9. <input type="checkbox"/> Other _____. |

/nathan Flynn/ SPE 2154

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DETAILED ACTION

- 1.** Claims 1, 4, 7-12, 14, 15, and 17-20 are allowed.

EXAMINER'S AMENDMENT

2. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Mr. George B.F. Yee on 03/26/2008.

3. The application has been amended as follows:

In the specification:

Please amend starting paragraph [0001] as follows:

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[0001] The present application is a continuation-in-part of and claims priority to U.S. Patent No. 6,728,849 ~~Application No. 10/022,306,~~ ~~filed on December 14, 2001,~~ and U.S. Patent No. 6,731,470 ~~Application No. 09/823,470,~~ ~~filed on March 30, 2001,~~ which are both incorporated by reference.

Please amend starting Paragraph [0016] as follows:

[0016] In another embodiment, a computer storage medium (e.g., disk storage or internal random access memory) includes a computer program for handling a remote copy request in a distributed storage system. The computer program includes code for retrieving a given request from a plurality of requests to be sent to a secondary storage system from a primary storage system, the retrieved request having equal or higher priority than the remaining requests; code for selecting a first path group to be used in transmitting the retrieved request, the first path being selected by accessing a path selection table that provides one or more path groups that may be used to transmit the retrieved request; and code for transmitting the retrieved request using the selected first path to the secondary storage system, the secondary storage system including a plurality of secondary volumes that are paired to a plurality of primary volumes provided in the primary storage system.

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4. Please replace the claims as attached.

In the claims:

1. (Currently Amended) A method for handling a remote copy request in a distributed storage system, the method comprising:

providing a plurality of primary volumes within a primary storage system that is coupled to a primary host via a first network, the primary storage system being coupled to a secondary storage system via a second network, wherein each primary volume is assigned a priority;

selecting a first request from a plurality of requests placed in a queue based on priority information associated with the requests, wherein each request is directed to a given primary volume and is assigned the same priority as the given primary volume;

selecting a first path group from one or more path groups that could be used to transmit the request; [[and]]

transmitting the first request to the secondary storage system using the first path group, the secondary storage system including a plurality of secondary volumes that are paired to the plurality of primary volumes;

receiving a second request at the primary storage system from the primary host;

identifying a primary volume to which the second request is directed;

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determining the priority of the primary volume to which the second request is directed; and

assigning the same priority to the second request as the priority of the primary volume to which the second request is directed,

wherein the primary storage system includes a path selection table that is accessed to determine the priority of the primary volume,

wherein the path selection table associates each of the primary volumes with one or more path groups and the priority.

2. (Canceled)

3. (Canceled)

4. (Currently Amended) The method of claim 1, further comprising:
~~receiving a second request at the primary storage system from the primary host;~~
~~identifying a primary volume to which the second request is directed;~~

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~~determining the priority of the primary volume to which the second request is directed; and~~

~~assigning the same priority to the second request as the priority of the primary volume to which the second request is directed,~~

wherein the first request and the second request are the same request.

5. (Canceled)

6. (Canceled)

7. (Currently Amended) The method of claim 1, wherein the ~~primary storage system maintains a path selection table and a path group table, the path selection table associating each of the primary volumes with one or more path groups and the priority value, the path group table~~ associates~~es~~ing each path group with one or more ports.

8. (Original) The method of claim 7, wherein the path group table associates each path group with a given constraint.

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9. (Original) The method of claim 1, further comprising:
selecting a port from one or more ports associated with the
selected path group.

10. (Original) The method of claim 1, further comprising:
determining whether or not a constraint defined for the first path
group is satisfied;
selecting second path group from the one or more path groups
that could be used to transmit the request if the constraint is not satisfied;
and
selecting a port from one or more ports associated with the first
path group if the constraint is satisfied.

11. (Original) The method of claim 10, wherein the first path
group is preferred over the second path group in transmitting the first
request.

12. (Currently Amended) A method for handling a remote copy
request, the method comprising:

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receiving a plurality of requests at a primary storage system from one or more primary hosts, including a first request and a second request, the primary storage system having a plurality of primary volumes, wherein each request is assigned a priority according to the primary volume[[s]] to which said each request is directed;

sorting the requests according to priority assigned to the requests;

retrieving one of the requests in the order by which the requests have been sorted; and

selecting a first path group to be used in transmitting the retrieved request, the first path being selected by accessing a path selection table ~~that provides~~ having information that relates each primary volume to one or more path groups that may be used to transmit the retrieved request thereto,[[;]]

wherein the retrieved request is transmitted to a secondary storage system after the selecting step, the secondary storage system including a plurality of secondary volumes that are paired to the plurality of primary volumes,

wherein the path selection table assigns one or more path groups to each of the plurality of primary volumes,

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wherein the first request is directed to a first primary volume to which a first priority is associated, whereby the first request is assigned to the first priority,

wherein the second request is directed to a second primary volume to which a second priority is associated, whereby the second request is assigned to the second priority.

13. (Canceled)

14. (Original) The method of claim 12, wherein the path selection table maintains priority information for each of the plurality of primary volumes.

15. (Currently Amended) A computer program product ~~storage medium including a computer program~~ for handling a remote copy request in a distributed storage system, the computer program, comprising:

a computer readable storage medium having stored thereon computer program code, the computer program code configured to cause a processor to perform steps of:

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~~code for~~ retrieving a given request from a plurality of requests to be sent to a secondary storage system from a primary storage system, wherein each primary volume is associated with a plurality of priority value, wherein each request received at the primary storage system is assigned a priority value that corresponds to the priority value of the primary volume designated by the request, the retrieved request having equal or higher priority than any remaining requests;

~~code for~~ selecting a first path group to be used in transmitting the retrieved request, the first path being selected by accessing a path selection table that provides one or more path groups that may be used to transmit the retrieved request, wherein the path selection table associates each of the primary volumes with one or more path groups and the priority; and

~~code for~~ transmitting the retrieved request using the selected first path to the secondary storage system, the secondary storage system including a plurality of secondary volumes that are paired to a plurality of primary volumes provided in the primary storage system.

16. (Canceled)

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17. (Currently Amended) A storage system, comprising:
a storage controller to handle remote copy requests received from a host coupled to the storage system via a first network;
a plurality of primary volumes that are paired to a plurality of secondary volumes provided in a remote storage system that is coupled to the storage system via a second network, wherein each primary volume is assigned a priority;[[.]]

a memory device including a path selection table, the path selection table assigning each of the plurality of primary volumes with one or more path groups that may be used to transmit a request that is associated with a given primary volume; and

a computer program including
code for assigning a first request received from the host with a first priority value that corresponds to priority assigned to a first primary volume to which the first request is directed~~associated~~,

code for assigning a second request from the host with a second priority value that corresponds to priority assigned to a second primary volume to which the second request is directed~~associated~~, the first priority value being higher than the second priority value, and

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code for sorting the first and second requests according to their priority values, wherein the first request is placed ahead of the second request in a queue.

18. (Original) The storage system of claim 17, wherein the second request is received at the storage system prior to the first request.

19. (Original) The storage system of claim 17, wherein the storage controller includes a path group table that maps each of the one or more path groups to one or more ports.

20. (Original) The storage system of claim 19, wherein each of the path group listed in the path group table is provided with a constraint that needs to be satisfied in order to use the path group to transmit the request to the remote storage system.

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5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to MOHAMMAD A. SIDDIQI whose telephone number is (571)272-3976. The examiner can normally be reached on Monday -Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nathan J. Flynn can be reached on (571) 272-1915. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Art Unit: 2154

MAS

/Nathan J. Flynn/

Supervisory Patent Examiner, Art Unit 2154